Desalination Case Negative

Table of Contents

Inherency

US Already has and is Producing Desalination Plants in the Squo

Leven, 13 (Rachel, Correspondent for Water Law & Policy Monitor, U.S. Desalination Industry Grows Since 2000; Seen as Essential to Meeting Supply Needs, August 21, 2013, http://www.bna.com/us-desalination-industry-n17179876105/)

Supporters of the technology say this "drought-proof tool" and the ability to tap new sources of water make desalination an enticing and necessary industry for the road ahead. Desalination is best used as a part of an integrated water plan, water officials from San Diego, Tampa, Fla., and El Paso, Texas, told BNA. That means water management and conservation come first. Water reuse--or water that has been reclaimed through the wastewater treatment process, but may not be suitable for drinking or domestic use--can fulfill a need by providing supply for irrigation or industrial users. Desalination can supplement these measures to ensure an adequate supply of clean water.

US Already has and is Producing Desalination Plants

Leven, 13 (Rachel, Correspondent for Water Law & Policy Monitor, U.S. Desalination Industry Grows Since 2000; Seen as Essential to Meeting Supply Needs, August 21, 2013, http://www.bna.com/us-desalination-industry-n17179876105/)

With supplies of clean water becoming more scarce in certain areas and demand increasing, desalination is on the rise in the United States, water professionals told BNA. Half again as many municipal desalination plants were built between 2000 and 2010 as were built in the preceding three decades, according to research by water sector consultant Mike Mickley that was published in 2012 in the IDA Journal of Desalination and Water Reuse, the journal of the International Desalination Association. During that decade, 117 municipal desalination plants were constructed, bringing the total to 324 plants built since 1971, Mickley wrote in his article, "US Municipal Desalination Plants: Number, Types, Locations, Sizes, and Concentrate Management Practices." Those figures include municipal plants with the capacity to produce 25,000 gallons per day or more of potable water. Desalination grew significantly due to improved technology, a decline in cost, and dwindling supplies of water in the face of heightened demand, according to researchers, local water managers, and government officials. Many of these officials say desalination will continue to grow, although some are unsure if the industry will be able to overcome the hurdles posed by regulatory requirements. Most water professionals emphasized the need for desalination to play a key role in meeting future water needs. "You can't conserve your way out of a water shortage completely," Bob Yamada, water resources manager for San Diego County Water Authority, said. San Diego County will begin receiving water from a new desalination plant in Carlsbad, Calif., with a 50-million-gallon-per-day capacity by 2016.

Desalination already is in Use to Solve Water Problems in US

Leven, 13 (Rachel, Correspondent for Water Law & Policy Monitor, U.S. Desalination Industry Grows Since 2000; Seen as Essential to Meeting Supply Needs, August 21, 2013, http://www.bna.com/us-desalination-industry-n17179876105/)

Desalination and water reuse already play a significant role in addressing water supply needs, Mike Hightower, Sandia National Laboratories lead on an Energy Department project reviewing energy and water needs and issues, said. More than 40 percent of domestic supplies--water for drinking, cooking, and bathing, among other purposes--comes from desalination and wastewater reuse. That breaks down to roughly 30 percent from wastewater reuse and 13 percent from desalination nationwide, Hightower said. "You can see already that even though people

don't know it, desalination and wastewater reuse are a large percentage of the domestic [commercial and residential] water supply in the United States," Hightower told BNA. The number of desalination plants within the United States grows exponentially when industrial plants are considered because industrial facilities greatly outnumber municipal ones. A Pacific Institute study, Desalination, With a Grain of Salt, found there were roughly 2,000 desalination plants larger than 300,000 gallons per day operating in the United States as of 2005 when industrial plants are figured in.

Solvency

Desalination strategies discourage sustainability and long term adaptation.

Wilder et al in 10 (Margaret, Christopher A Scott, Nicolas Pineda Pablos, Robert G Varady, Gregg M Garfin, and Jamie McEvoy; Latin American Studies and Udall Center for Studies in Public Policy U of Arizona, School of Geopgraphy and Development and Udall Center U of Arizona, Public Policy Studies El Colegio de Sonora, Udall Center U of Arizona, Institute of the Environment and School of Natural Resources and Environment U of Arizona, and School of Geography and Development U of Arizona; "Adapting Across Boundaries: Climate Change, Social Learning, and Resilience in the U.S.-Mexico Border Region," Annals of the Association of American Geographers 100(4); Scholar)

> **Desalination** of seawater has attracted both attention and financing by those who see it as a failproof source of water in the study region (Kohlhoff and Roberts 2007). As the cost of desalination has decreased, its appeal for augmentation has risen. Nevertheless, desalination **does not rank high in** our measures of **adaptive potential**. Although **desalination**, as a technological innovation, could meet increasing demand, it **is unlikely to prompt sustainable change in** water users' **behaviors under climate change**. In fact, **desalination, if not coupled with conservation measures, enables a business as- usual water culture**—averse to social learning—**and discourages sustainable water use. The region's major urban areas would become dependent on** both desalination **technology and good relations between U.S. and Mexican authorities**—each of **which could prove unreliable**.

No adaptive potential for desalination and no model spillover – may actually exacerbate consumption.

Wilder et al in 10 (Margaret, Christopher A Scott, Nicolas Pineda Pablos, Robert G Varady, Gregg M Garfin, and Jamie McEvoy; Latin American Studies and Udall Center for Studies in Public Policy U of Arizona, School of Geopgraphy and Development and Udall Center U of Arizona, Public Policy Studies El Colegio de Sonora, Udall Center U of Arizona, Institute of the Environment and School of Natural Resources and Environment U of Arizona, and School of Geography and Development U of Arizona; "Adapting Across Boundaries: Climate Change, Social Learning, and Resilience in the U.S.-Mexico Border Region," Annals of the Association of American Geographers 100(4); Scholar)

> Overall, then, **we assess** the augmentation strategies of **desalination to be** of **low adaptive potential**. Assessed against the identified indicators, the desalination **proposals do not involve structured opportunities for social learning or changes in institutional culture or policy priorities**. **Data sharing would be** in the context of formal **contract-based exchanges, rather than** more **permeable**, fluid, **relational** kinds of **knowledge exchanges** such as those identified by Cash et al. (2003). **New communities of practice are not anticipated to emerge from desalination strategies and binational relationships will be straitjacketed within a bounded legal framework**. **The desalination strategies are not only unlikely to add to adaptive capacity, but** they **could lead to more** of the **entrenched, legalistic relations that have** sometimes **hampered cooperative**, binational **water management** in the past. **Absent a conservation strategy**, **these strategies enable a status quo water culture that views desalinated seawater as a limitless substitute for fresh water**. Ironically, **increased interdependence will ensue** under the proposed desalination strategies, **requiring improved cooperation** between the United States and Mexico, **yet these strategies do little**

to foster better communication and enhanced collaboration and therefore could actually **increase vulnerability**.

Desal can't solve all instances and leads to irresponsible use of water, if it fails the problem will be even worse

EarthTalk 2013 "Can Ocean Desalination Solve the World's Water Shortage?," http://environment.about.com/od/biodiversityconservation/a/desalination.htm

Food & **W**ater **W**atch **advocates** instead **for better fresh water management practices. "Ocean desalination hides the growing water supply problem instead of focusing on water management and lowering water usage,**" the group reports, citing a recent study which found that **California can meet its water needs for the next 30 years by implementing cost-effective urban water conservation. Desalination is "an expensive, speculative supply option that will drain resources away from more practical solutions,"** the group says.¶ Despite such arguments, the practice is becoming more common. Ted Levin of the Natural Resources Defense Council says that more than 12,000 desalination plants already supply fresh water in 120 nations, mostly in the Middle East and Caribbean. And analysts expect the worldwide market for desalinated water to grow significantly over the coming decades. Environmental advocates may just have to settle for pushing to "green" the practice as much as possible in lieu of eliminating it altogether.

Desalination has been overhyped for years

National Research Council, 08 (6 The Costs and Benefits of Desalination ." Desalination: A National Perspective . Washington, DC: The National Academies Press, 2008 .)

The promise of desalination to rid the world of water scarcity has been touted for nearly 50 years. During this period, public and private investment in developing and improving desalination technology has totaled more than a billion dollars (see Chapter 2). Although much progress has been made and there have been successes in developing water supplies in very dry locales and regions, the promise remains largely unfulfilled. The explanation lies with the fact that, although the process costs have been reduced, the total costs of desalination, including the costs of planning, permitting, and concentrate management, remain relatively high, both in absolute terms and in comparison with the costs of other alternatives.

AT: Cost of Desal Low

Desal plants cost billions

Onishi 2010 Norimitsu, writer, "Arid Australia Sips Seawater, but at a Cost," http://www.nytimes.com/2010/07/11/world/asia/11water.html

> **In one of the country's biggest infrastructure projects in its history, Australia's five largest cities are spending $13.2 billion on** desalination **plants** capable of sucking millions of gallons of seawater from the surrounding oceans every day, removing the salt and yielding potable water. In two years, when the last plant is scheduled to be up and running, Australia's major cities will draw up to 30 percent of their water from the sea.

Long term costs make it financially infeasible

EarthTalk 2013 "Can Ocean Desalination Solve the World's Water Shortage?," http://environment.about.com/od/biodiversityconservation/a/desalination.htm

> According to the non-profit Food & Water Watch, **desalinated ocean water is the most expensive form of fresh water out there, given the infrastructure costs of collecting, distilling and distributing it. The group reports that, in the U.S., desalinated water costs at least five times as much to harvest as other sources of fresh water**. Similar high costs are a big hurdle to desalination efforts in poor countries as well, where limited funds are already stretched too thin.

There is no Umbrella Price for Desalination

National Research Council,08 (" 6 The Costs and Benefits of Desalination ." Desalination: A National Perspective . Washington, DC: The National Academies Press, 2008 .)

> The cost to treat seawater or brackish waters to produce potable water is a function of numerous variables, and the components of these costs are frequently difficult to ascertain precisely from the literature. Although selling prices are reported for many international public-private projects, data on the components of the total cost and price are not reported and not available because they are regarded as confidential information by firms in the business and because of regulatory and public policies. The confidential nature of this information reflects the competitive nature of the international water business. Although water rates (or tariffs) are public information, these rates reflect the project-specific evaluation criteria, scope of work, and technical process impacts based on local conditions and requirements; therefore, they are not consistent from country to country or place to place. Consequently, tariffs do not provide a simple indicator for cost comparisons. Different project costs are also difficult to compare because virtually every desalination plant has its own unique design and site conditions and its own unique financing package. Table 6-1 provides an example of such comparative costs for three projects: the desalination facilities built and operated by the Inland Empire Water Agency in southern California for the purpose of desalting brackish water; the brackish water desalination project in Texas developed by the El Paso Water Utilities in cooperation with the U.S. Army (see Box 5-2); and the Tampa Bay seawater desalination plant in Florida. Although it is tempting to draw conclusions from comparisons such as these, particularly with respect to the sensitivity of costs to source water salinity, great care must be exercised. For example, sometimes there are financing offsets that lower the apparent costs to the end users. Both Inland Empire and Tampa Bay will receive such offsets ($0.20/m3 or $250/acre-foot [a.f.] to Inland Empire from the Metropolitan Water District of Southern California; $0.09/m3 or $111/a.f. to Tampa Bay from the Southwest Florida Water Management District), although these offsets are not factored into the costs reported in Table 6-1

Desalination is too expensive and kills biodiversity. It's a better idea to recycle and conserve water and import for the remaining deficit.

LA Times 13

Kerry Cavanaugh went to Columbia University and Graduate School of Journalism, New York University, editorialist for the LA Times *'Desalination isn't the answer to California's water problem'* November 13, 2013 http://articles.latimes.com/2013/nov/13/news/la-ol-ocean-water-desalination-20131112

On Wednesday, the California Coastal Commission may green-light a massive desalination plant in Huntington Beach. If approved, it would be the second operation in the area. The nation's largest seawater-to-drinking-water facility is under construction in Carlsbad and is expected to begin delivering a potable product in 2016. Coastal Commission staff have recommended major changes to the proposed Huntington Beach plant to prevent marine life from being sucked up with the seawater. Staff estimate the ocean intake pipe could pull in some 80 million fish larvae, eggs and tiny sea creatures from about 100 miles of the coastline. They want the applicant, Poseidon Resources, to build an intake system under the sea floor that would gently pull water through a layer of sand, filtering out the marine life. Poseidon has said that would be too expensive and would effectively kill the project. Here's my recommendation. Shelve the proposal. Ocean water desalination doesn't pencil out. It's far too expensive to produce potable water from seawater — about $2,000 an acre foot, compared to about $1,000 an acre foot for imported water. It requires a tremendous amount of energy to purify saltwater. And there are potentially serious environmental impacts from sucking in millions of gallons of ocean water and pumping the leftover brine back into the ocean. That's why Long Beach shelved plans for a desalination project with the Los Angeles Department of Water and Power. It's a lot cheaper to conserve water or recycle it. In fact, Orange County has a model water recycling operation down the road in Fountain Valley, where sewage water is purified in a treatment plant and then pumped to large ponds to percolate into the groundwater supply. This costs about $900 an acre foot and uses one-third the amount of electricity of a desalination plant, according to the Orange County Water District. And it reuses wastewater rather than sticking a straw in the ocean. Climate change will affect the reliability of California's water supply. Utilities throughout the state should be thinking about how to use less water imported from Northern California and the Colorado River, and developing "homegrown" water through recycling and conservation. Desalination should be a last resort.

Econ

Econ Up

U.S. and global economic growth will grow this year

Moody's Investors Service, Staff Writer, May 8, **2014**, "Advanced economies likely to drive global growth in 2014-15 as emerging markets slow down," Global Credit Research, https://www.moodys.com/research/Moodys-Advanced-economies-likely-to-drive-global-growth-in-2014--PR_298858, Accessed 5/18/2014

Moody's notes that reforms and accommodative monetary policy in the aftermath of the global financial and the euro area crises are slowly bearing fruit in advanced economies. After a soft patch at the start of the year, US economic activity is set to pick up during 2014 on the back of strong corporate balance sheets, favourable financing conditions, a smaller fiscal drag and strong price competitiveness. Moreover, after two years of recession, the euro area will contribute positively to global growth in 2014 as exporters benefit from competitiveness-improving reforms and as constraints on households' budgets ease.

Global economic growth will be steady this year

Moody's Investors Service, Staff Writer, May 8, **2014**, "Advanced economies likely to drive global growth in 2014-15 as emerging markets slow down," Global Credit Research, https://www.moodys.com/research/Moodys-Advanced-economies-likely-to-drive-global-growth-in-2014--PR_298858, Accessed 5/18/2014

Overall, positive developments in advanced economies will raise global growth this year to around 3%. For emerging markets, growth in 2014 is likely to be lower than in 2013. In 2015, as stronger trade spills over to improved domestic activity in most countries, global growth is expected to rise further, to reach close to 3.5% for the G20 economies, in line with historical averages.

AT: U.S. Key

China will outpace the U.S. role in global growth this year

The Economic Times, Staff Writer, April 30, **2014**, "China poised to overtake US economy: World Bank ranking," http://economictimes.indiatimes.com/news/international/business/china-poised-to-overtake-us-economy-world-bank-ranking/articleshow/34433509.cms, Accessed 5/18/2014

In 2005, on a PPP basis, Chinese output amounted to about 43.0 percent of US GDP, but in 2011 this had risen to nearly 87.0 percent, doubling its relative performance. China has been catching up for several years, since it became a player across the global economy. It now looks possible that in the course of this year, the Asian behemoth will overtake the United States in terms of output on a purchasing-power basis.

China will surpass the U.S. this year as the most important economy

Kevin **Lamarque**, Staff Writer, May 02, **2014**, "No longer #1? China may replace US as biggest economy this year – World Bank," RT, http://rt.com/business/155892-china-overtake-us-economy/, Accessed 5/18/2014

Sometimes size DOES matter. China may pass the US and become the world's most important economy this year, according to the World Bank. It would take the position the US has held since 1872. Previous studies have suggested China could become the world's biggest economy by 2019. Ever since the 2008 financial crisis, the Chinese economy has contributed a quarter of total global growth. Between 2011-2014, China's economy will account for 24 percent, according to IMF estimates.

AT: Impacts

Economic doomsaying deters investment and lending, which hurts the economy

Zachary **Karabell**, Guest contributor and a money manager, May 1, **2014**, "Cassandras Everywhere," Slate, http://www.slate.com/articles/business/the_edgy_optimist/2014/05/global_economic_collapse_the_cassandras_who_are_predicting_a_crash.html, Accessed 5/18/2014

> The cult of doom has been thriving ever since the meltdown of 2008. With so many having been caught off guard by the cascading crisis triggered by the collapse of Lehman Brothers in September 2008, a never-again mentality took hold, especially in the United States. Europe had its own reckoning over the euro soon after, and has been mired not just in stagnant growth but pessimism ever since. The reasons for today's caution verging on paranoia are understandable, but the effects are no less destructive. Trillions of dollars sit on corporate balance sheets unused as companies and their CEOs wonder whether now is a good time to spend. Banks, trying to preserve capital provided to them largely by government, have been reluctant to lend, though they are certainly doing so more now than in the immediate aftermath of 2008–2009. Believing that the financial system is imperiled by a Fed out of control and by trillions in debt, wide swaths of the political class emboldened by the Tea Party continue to sound the klaxon of austerity, forcing ever more shrinkage of what little government spending there is on infrastructure, science, and investment.

Economic decline does not lead to war

Robert **Jervis**, Adlai E. Stevenson Professor of International Politics in the Department of Political Science, and a Member of the Arnold A. Saltzman Institute of War and Peace Studies at Columbia University, July 2011, "Force in Our Times," Saltzman Working Paper No. 15, http://www.siwps.com/news.attachment/saltzmanworkingpaper15-842/SaltzmanWorkingPaper15.PDF, Accessed 5/18/2014

> Even if war is still seen as evil, the security community could be dissolved if severe conflicts of interest were to arise. Could the more peaceful world generate new interests that would bring the members of the community into sharp disputes? 45 A zero-sum sense of status would be one example, perhaps linked to a steep rise in nationalism. More likely would be a worsening of the current economic difficulties, which could itself produce greater nationalism, undermine democracy, and bring back old-fashioned beggar-thy-neighbor economic policies. While these dangers are real, it is hard to believe that the conflicts could be great enough to lead the members of the community to contemplate fighting each other. It is not so much that economic interdependence has proceeded to the point where it could not be reversed – states that were more internally interdependent than anything seen internationally have fought bloody civil wars. Rather it is that even if the more extreme versions of free trade and economic liberalism become discredited, it is hard to see how without building on a pre-existing high level of political conflict leaders and mass opinion would come to believe that their countries could prosper by impoverishing or even attacking others. Is it possible that problems will not only become severe, but that people will entertain the thought that they have to be solved by war? While a pessimist could note that this argument does not appear as outlandish as it did before the financial crisis, an optimist could reply (correctly, in my view) that the very fact that we have seen such a sharp economic down-turn without anyone suggesting that force of arms is the solution shows that even if bad times bring about greater economic conflict, it will not make war thinkable.

Can't Solve Econ

Cost of desalination high

Cooley 10

Heather Cooley, Author: Seawater Desalination: Panacea or Hype?
http://www.actionbioscience.org/environment/cooley.html

> The cost of desalination has fallen in recent years, but it remains an expensive water-supply option. Typical costs for water produced through desalination range from $1,200-2,000 per acre-foot—substantially more expensive than most other water supply and demand management options. The assumption that desalination costs will continue to fall may be false. Further cost reductions may be limited, and actually, future costs may increase.

Current desalination technology is too expensive for developing countries

Agboola, Al-Mutaz, Orfi, and Egelioglu, 2-8

O. Phillips Agboola, I. S. Al-Mutaz, and Jamel Orfi, College of Engineering, King Saud University, Saudi Arabia, and Fuat Egelioglu, Mechanical Engineering Department, Eastern Mediterranean University, Turkey
http://www.hindawi.com/journals/ame/2014/925976/

> In many parts of the developed countries, most especially in millennium cities, the supply of potable water to homes is often taken for granted by the people. The assumption that potable water exists in abundance is luxury to those residing in the desert regions of the world. Water as we know it today does not exist as potable in most sources due to contamination (because of industrial and household waste contaminations), heavy metals contents (in some cases), and salinity. In order to use water for human consumption (drinking and/or cooking), it must be treated to get rid of organisms capable of causing all sorts of diseases and minerals and organic substances that could cause harm. Potable water should be colourless (free from colour) and be free from odour, apparent turbidity, and taste.
>
> Many developing (and underdeveloped) countries are struggling to make potable water available to their citizens, due to nonavailability of adequate water sources and/or poor management of the available water sources. In most parts of the world, the demand for water outweighs its supply, a situation calling for innovative technologies for new water sources. Cyprus is located on the Mediterranean basin, with very limited potable water sources. The country is surrounded by the Mediterranean Sea; the seawater source is not readily consumable. The northern part of Cyprus is under economic embargo, a situation that exponentially worsens the fresh water availability on that part of the island. The government does not supply potable water to households due to the high cost of treating the high salinity water sources. Seawater intrusion because of over extraction of underground water and consistent drought has led to the high salinity of the water sources [1]. The water supply to houses through different municipalities contains between 1000 and 2500 ppm of salt.

Warming Turn

Links

Desalination projects need massive amounts of energy and cause more emissions Kelley 11

[Angela Haren, Law professor at Golden Gate University School of Law, *Seawater Desalination: Climate Change Adaptation Strategy or Contributor?* Ecology Law Currents Vol 38:40 pg 40-50 2011 *http://elq.typepad.com/currents/2011/currents38-06-Kelley-2011-1202.pdf*

A serious disadvantage to seawater desalination is the amount of energy it requires. Seawater desalination is one of most energy intensive water supply option available. n37Desalination systems using reverse osmosis technology require about 30 percent more energy than existing inter-basin supply systems delivering water to parts of Southern California. [n38]Consequently, desalination would indirectly cause more GHG emissions than alternatives. Studies indeed show that extensive development of seawater desalination could lead to "greater dependence on fossil fuels, an increase in greenhouse gas emissions, and a worsening of climate change." [n39]

Desalination burns fossil fuels and takes a heavy toll on marine biodiversity

Scientific American 09["Solar-Powered Desalination an Alternative for Treating Farm Runoff | KQED." The California Report. N.p., 20 Jan. 2009. Web. 26 June 2014. <http://www.californiareport.org/archive/R201405090850/b>.]

¶ The relationship between desalinization and climate change is complex. Global warming has increased droughts around the world and turned formerly verdant landscapes into near deserts. Some long held fresh water sources are simply no longer reliably available to hundreds of millions of people around the world.¶ ¶ Meanwhile, expanding populations in desert areas are putting intense pressure on existing fresh water supplies, forcing communities to turn to desalinization as the most expedient way to satisfy their collective thirst. But the process of desalinization burns up many more fossil fuels than sourcing the equivalent amount of fresh water from fresh water bodies. As such, the very proliferation of desalinization plants around the world, some 13,000 already supply fresh water in 120 nations, primarily in the Middle East, North Africa and Caribbean, is both a reaction to and one of many contributors to global warming.¶ ¶ Beyond the links to climate problems, marine biologists warn that widespread desalinization could take a heavy toll on ocean biodiversity; as such facilities' intake pipes essentially vacuum up and inadvertently kill millions of plankton, fish eggs, fish larvae and other microbial organisms that constitute the base layer of the marine food chain. And, according to Jeffrey Graham of the Scripps Institute of Oceanography's Center for Marine Biotechnology and Biomedicine, the salty sludge leftover after desalinization for every gallon of freshwater produced, another gallon of doubly concentrated salt water must be disposed of can wreak havoc on marine ecosystems if dumped willy-nilly offshore. For some desalinization operations, says Graham, it is thought that the disappearance of some organisms from discharge areas may be related to the salty outflow.

Environment Turn

Desalination plants harm the environment

Danoun 07

Rashad Danoun, Author, "Desalination Plants: Potential impacts of brine discharge on marine life" http://ses.library.usyd.edu.au/bitstream/2123/1897/1/Desalination%20Plants.pdf

Several environmental impacts could be addressed in terms of running on a desalination facility. It is assumed that using desalination as a water resource would have considerable environmental impacts to the surrounding area including the ecosystems. Significant energy consumption in the desalination process, in order to produce electricity and heat, would lead to greenhouse gas emissions into the atmosphere. The other major issue that can rise in terms of building a desalination plant is the double salt concentration that has been extracted from the seawater and will in most cases be deposited into the ocean as discharge brine. Regardless of the method used in the desalination facility, a number of factors can determine the environmental cost of desalination plants on the surrounding environment. In the reverse osmosis technology, fifty percent of the feed water will be potable water and the other fifty percent will be the discharge brine. It has been estimated that the expected salinity level of the discharge brine is approximately double which equals to 64-70 ppt part per thousands. This is a highly concentrated waste product consisting of everything that was removed from the seawater to produce fresh water. Environmental impacts associated with concentrated discharge have historically been considered as a major environmental concern to marine life with desalination plants.

The effects of brine discharge harm marine life

Danoun 07

Rashad Danoun, Author, "Desalination Plants: Potential impacts of brine discharge on marine life" http://ses.library.usyd.edu.au/bitstream/2123/1897/1/Desalination%20Plants.pdf

Some arguments will be raised against building desalination plants on the grounds of environmental impacts to the surrounding area, especially to marine life due to the high concentrated brine discharge that diffuses back into the ocean. The impacts of the brine discharge are due to the high level of salinity and total alkalinity and alteration to the temperature. These impacts could be considerable in terms of the influence on the marine organisms such as the development of species, survival of larva and breeding and reproductive traits. However this paper provides some evidence that the influence of discharge for desalination plant can be neglected in term of any environmental impact to the aquatic flora and fauna species.

Bio-D DA

Links

Desalination techniques kill massive amounts of marine life

Kelley 11 [Angela Haren, Law professor at Golden Gate University School of Law, *Seawater Desalination: Climate Change Adaptation Strategy or Contributor?* Ecology Law Currents Vol 38:40 pg 40-50 2011 *http://elq.typepad.com/currents/2011/currents38-06-Kelley-2011-1202.pdf*

Another disadvantage is that desalination **plants using open seawater intakes pose a serious threat to marine ecosystems.** [n45] **Open seawater intakes withdraw large volumes of water through pipes in the water columns of oceans, bays, and estuaries for industrial processes such as cooling power plants or supplying water for** desalination **facilities. Large organisms such as fish, marine mammals, and turtles are injured or killed when they become trapped or "impinge[d]" on the screens of the intake pipes.** [n46] **Smaller organisms, such as plankton and larvae, pass through the screens but are killed as they become "entrain[ed]" in the** desalination **plants.** [n47]For decades, California's coastal power plants have used open seawater intakes for cooling systems known as once-through cooling. [n48] Combined, these plants were permitted to withdraw over fifteen billion gallons of seawater per day, [n49] killing an estimated seventy-nine billion fish and other marine life annually, [n50] including threatened and endangered species, such as the Delta smelt. [n51] State and federal agencies acknowledged that these power plants degrade marine life, impair coastal habitats, and contribute to declining [*46] fisheries.[n52] To address this serious issue, the California State Water Resources Control Board passed a policy in spring 2010 to phase out the use of once-through cooling. [n53]**Despite the fact that the use of open seawater intakes for once-through cooling will be phased out, thirteen of the twenty proposed** desalination **plants in California plan to use open seawater intakes to withdraw water, and ten of these will likely co-locate with existing power plants in order to share the intake pipes or take over the pipes if and when the power plants shut down.** [n54] **If proposed seawater** desalination **plants utilize open intakes, they could perpetuate the destruction of marine life**. Furthermore, allowing the proposed desalinationplants to co-locate with power plants that use once-through cooling could potentially prolong the existence of these old, inefficient, GHG emitting power plants.

Water desalination harms the environment and kills biodiversity

Francis ND

[Francis, Katie. "Desalination of Seawater Can Do More Harm than Good | Greenopedia." *Desalination of Seawater Can Do More Harm than Good | Greenopedia*. N.p., n.d. Web. 24 June 2014. <http://greenopedia.com/article/desalination-seawater-can-do-more-harm-good>.]

Ocean desalination plants are located just off the coast, where their intake pipes **suck in billions of fish, eggs, and other small organisms every day, along with the seawater**. **Once these living organisms enter the** machinery of the **desalination plant, they are killed**. **This represents a huge loss of life and could potentially destroy entire ecosystems.**¶ **Additionally, the high energy levels needed to run these plants may also contribute to environmental problems. The** desalination **process requires huge amounts of electricity to separate drinkable water from dissolved salts and other minerals. Burning fossil fuels is the most common method of attaining this energy, which**, of course, **contributes to air pollution and the greenhouse gas effect**.¶ Mixing Brine Outflow with Natural Seawater¶ In addition to the machines themselves, a**nother serious environmental concern is the quality of the water put back into the ocean after the drinkable water is collected. This outflow is called brine because of its extremely high salt content** (all of the non-salty water has been removed). Not only does brine have more salt than natural seawater, **it** also **commonly contains leftover chemicals and metals from the treatment process.**¶ **Components of brine and their related environmental issues include:**¶ **Chlorine**: interacts with preexisting chemicals to form carcinogens and mutagens.¶ **Acids**: damage the tissues of organisms.¶ **Products used for machinery upkeep**: **cause algal blooms and eventual loss of oxygen in the area.**¶ **Heavy metals**: accumulate at the bottom of the ocean where sea creatures ingest them and eventually pass them to humans, where they could be toxic.

Widespread desal collapses ocean biod

EarthTalk 2013 "Can Ocean Desalination Solve the World's Water Shortage?," http://environment.about.com/od/biodiversityconservation/a/desalination.htm

On the environmental front, widespread desalination could take a heavy toll on ocean biodiversity. "Ocean water is filled with living creatures, and most of them are lost in the process of desalination," says Sylvia Earle, one of the world's foremost marine biologists and a National Geographic Explorer-in-Residence. "**Most are microbial, but intake pipes to desalination plants also take up the larvae of a cross section of life in the sea, as well as some fairly large organisms…part of the hidden cost of doing busine**ss," she says.¶ Earle also points out that the very salty residue left over from desalination must be disposed of properly, not just dumped back into the sea. Food & Water Watch concurs, warning that **coastal areas already battered by urban and agricultural run-off can ill afford to absorb tons of concentrated saltwater sludge.**

Solar desalination creates toxic waste called brine—Balch doesn't mention this

Clarke 14[Clarke, Chris. "In Talk Of Solar Desalination, There's a Salty Elephant in the Room | Science | ReWire | KCET." KCET. N.p., 29 Jan. 2014. Web. 25 June 2014. <http://www.kcet.org/news/rewire/science/in-talk-of-solar-desalination-theres-a-salty-elephant-in-the-room.html>.]

It makes sense, if we're examining desalination as a way to mitigate the drought's effects on California, **to** try **to use renewable energy like solar power to cut down on long-term energy costs.** Hence the attention paid to stories like those in The Guardian.¶ **On paper, the idea seems reasonable**. Whether you use PV to power a reverse osmosis filtration setup, or take the simpler approach of using the sun's hear to distill fresh water from seawater, you're cutting down the long-term energy costs of the process. And that's likely to make desalination competitive much sooner, as this drought (as will likely happen) intensifies and repeats in our warming world.¶ **So it's not surprising that writer Oliver Balch's piece this week in The Guardian is getting some sympathetic exposure in social media. Focusing on the issue of brackish irrigation water in the Central Valley, Balch touts the WaterFX company's Aqua4 concentrating solar thermal desalination equipment** as a potential way of reclaiming that water, making it usable for crop irrigation and freeing up the water that would otherwise be used for other purposes.¶ And **Balch never once mentions the elephant in the room: the endless supply of toxic waste "brine" that desalination produces by definition.**¶ Agricultural waste water in the Central Valley contains salts that had leached from the soil by irrigation water -- sodium chloride (table salt), gypsum, and other common compounds that are environmentally toxic in high concentrations. It's also got the selenium compounds that occur naturally in the soil of the Westlands area, which famously caused wildlife deaths and deformities in the Kesterson National Wildlife Refuge in the 1980s. **It's got agricultural chemicals in it from fertilizers to insecticides and herbicides. It's got motor oil, antifreeze, and random non-point-source pollutants that filter out of the air**.¶ And **when you remove all that stuff from the water** in order to reuse the water, **you have to do something with it. But Balch doesn't mention that end of the process.**¶ WaterFX does mention the issue on their website, saying, "The remaining brine is concentrated into solid byproducts for resale."¶ What those products are, they don't say. In the best of cases that would vary with the project. It's hard to imagine a buyer that would have a use for the various and sundry dissolved chemicals in your typical Fresno County wastewater drain in solid form. Using solidified brine as a filler in construction material is one possibility you often hear mentioned, but the notion of recycling a brine that's legally considered toxic waste into a community's buildings and roadways raises certain inevitable Environmental Justice concerns.¶ Which means that **the safest assumption is that waste brine and solids from a central Valley desalination plant would go to the most convenient landfill or** (ideally) **a hazardous waste facility. And that poses an ironic problem: even the best-designed landfills and hazmat dumps eventually leak, putting that stuff right back into the groundwater.**¶ For desalination plants treating seawater, the problem of brine disposal is potentially even greater. One 1985 study of the contaminated ag waste water in the Central Valley's heavily polluted San Luis Drain showed the water contained 9.2 grams of total dissolved solids per liter of water. Clean seawater from the Pacific Ocean has around 38 grams of dissolved solids per liter.¶ That might

not seem like a huge problem: after all, people will shell out between five and ten bucks a pound for sea salt, which is just seawater with the water removed. But it adds up. If the Carlsbad plant puts out 50 million gallons of freshwater a day as advertised, that means (at 38 grams per liter, converted from the metric) it's removing 417,270 pounds of salt and other solids a day from that water.¶ And **unless the people of San Diego start eating a pound of sea salt for every three gallons of freshwater they drink, bathe in, or water their gardens with, that means a surplus of removed solids piling up at the desal plant.**¶ Along the coast, disposal of desalination waste usually involves pumping concentrated brine back into the ocean, under the assumption that the Pacific will dilute it. And it will, eventually, but that may take some time. Waste brine is heavier than seawater. It will thus tend to flow to the ocean floor, where currents are weaker and the brine will get diluted less quickly. If the brine flows into a hollow in the seabed, it may form a long-term pool of highly concentrated saltwater.

Desalination turns adaptation and causes fisheries collapse – means food price/supply is a DA to the counterplan.

Wilder et al in 10 (Margaret, Christopher A Scott, Nicolas Pineda Pablos, Robert G Varady, Gregg M Garfin, and Jamie McEvoy; Latin American Studies and Udall Center for Studies in Public Policy U of Arizona, School of Geopgraphy and Development and Udall Center U of Arizona, Public Policy Studies El Colegio de Sonora, Udall Center U of Arizona, Institute of the Environment and School of Natural Resources and Environment U of Arizona, and School of Geography and Development U of Arizona; "Adapting Across Boundaries: Climate Change, Social Learning, and Resilience in the U.S.-Mexico Border Region," Annals of the Association of American Geographers 100(4); Scholar)

Many **consequences of** the proposed **desalination**— **including** the **effects of brine** "reject" **discharge**—**are not known,** and the results of an environmental impact study scheduled for completion in December 2008 have not been released. No existing federal law regulates how a desalination plant operates in Mexico (L´opez-P´erez 2009). **Although developing new sources of fresh water to augment existing groundwater sources would protect aquifers** and potentially allow them to recover to nearer equilibrium levels, **perceived limitless supplies of water** likely **would encourage urban growth**. There could be **additional impacts on the fragile estuaries and fisheries of the Gulf of California and potential disruption of significant ecosystems where the proposed aqueduct would traverse the desert**. Moreover, **because Arizona and Nevada would continue to use their full allotments plus desalinated supply**— **without reducing current use**—**no net gains to the aquifers or to Colorado River allocations** likely **would be realized**.

China Cooperation DA

Links

Desalination Projects are extremely expensive and require government subsidies Kelley 11

[Angela Haren, Law professor at Golden Gate University School of Law, *Seawater Desalination: Climate Change Adaptation Strategy or Contributor?* Ecology Law Currents Vol 38:40 pg 40-50 2011 *http://elq.typepad.com/currents/2011/currents38-06-Kelley-2011-1202.pdf*

The cost of energy also makes desalination very expensive. In reverse osmosis plants, the cost of energy accounts for about 50 percent of the plants' operating costs. [n40] One proposed seawater desalination plant in the Camp Pendleton area in Southern California estimates that water produced by the plant would cost $ 2000 per acre-foot. [n41] This is extremely high compared to the current cost for treated water in that area, which remains between $ 600 and $ 700 per acre-foot. [n42]The high cost of seawater desalination requires that the government heavily subsidize desalination projects in order to ensure projects are profitable. For example, Poseidon requested at least $ 530 million in tax-free state bonds [*45] for its Carlsbad project. [n43] These public subsidies fund projects designed to generate profits for private companies. Poseidon originally projected a total cost of $ 270 million when it began the Carlsbad project in the late 1990s, but it now appears that it would cost at least twice that amount, with the public subsidizing the cost. [n44] The high costs of desalination and the associated GHG emissions call for a serious look at alternative uses of funds. These subsidies could go to conservation measures or municipal water recycling programs that would provide at least the same amount of water at a lower cost and create jobs throughout the state.